



Supplement of

Modernizing GNSS data acquisition, pre-processing, and distribution at volcanological observatories

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S1 rinexmod_run synopsis

```
1 usage: rinexmod_run [-h] -i RINEXINPUT [RINEXINPUT ...] -o OUTPUTFOLDER [-s SITELOG]
  ↪ [-k KEY=VALUE [KEY=VALUE ...]] [-m MARKER] [-co COUNTRY] [-n NINECHARFILE] [-sti
  ↪ STATION_INFO] [-lfi FILE_APRIORI] [-r RELATIVE] [-nh] [-c {gz,Z,none}] [-l] [-sh]
  ↪ [-fs] [-fc] [-fr] [-ig] [-a] [-ol OUTPUT_LOGS] [-w] [-v] [-t] [-u] [-fns
  ↪ {basic,flex,exact}] [-mp MULTI_PROCESS] [-d] [-rm] [-krr]
2
3 rinexmod takes RINEX files (v2 or v3/4, compressed or not), renames them,
4 modifies their headers, and writes them back to a destination directory
5
6 options:
7   -h, --help
8     show this help message and exit
9
10 required arguments:
11   -i RINEXINPUT [RINEXINPUT ...], --rinexinput RINEXINPUT [RINEXINPUT ...]
12     Input RINEX file(s). It can be:
13     1) a list file of the RINEX paths to process (generated with find or ls)
14     2) several RINEX file paths
15     3) a single RINEX file path (see -a/--alone for a single input file)
16
17   -o OUTPUTFOLDER, --outputfolder OUTPUTFOLDER
18     Output folder for modified RINEX files
19
20 optional arguments:
21   -s SITELOG, --sitelog SITELOG
22     Get the RINEX header values from a sitelog. Provide one file or a folder.
23
24   -k KEY=VALUE [KEY=VALUE ...], --modif_kw KEY=VALUE [KEY=VALUE ...]
25     Modification keywords for RINEX header fields and/or filename.
26     Format: -k keyword_1='value1' keyword2='value2'.
27     Overrides sitelog values. Acceptable keywords include: comment, marker_name,
  ↪ marker_number, receiver_serial, receiver_type, receiver_fw, antenna_serial,
  ↪ antenna_type, antenna_X_pos, antenna_Y_pos, antenna_Z_pos, antenna_H_delta,
  ↪ antenna_E_delta, antenna_N_delta, operator, agency, sat_system, interval,
  ↪ filename_file_period (01H, 01D...), etc.
28
29   -m MARKER, --marker MARKER
30     Four- or nine-character site code for renaming input files (also applies to the
  ↪ MARKER NAME header; overridden by -k marker_name='XXXX').
31
32   -co COUNTRY, --country COUNTRY
33     ISO 3166 three-letter country code for renaming input files. Overrides
34     other sources. See https://en.wikipedia.org/wiki/List\_of\_ISO\_3166\_country\_codes
35
36   -n NINECHARFILE, --ninecharfile NINECHARFILE
37     File with 9-char site names (e.g. from the M3G database).
38
39   -sti STATION_INFO, --station_info STATION_INFO
40     GAMIT station.info file with GNSS site metadata (requires -lfi).
41
42   -lfi LFILE_APRIORI, --lfile_apriori LFILE_APRIORI
43     GAMIT apriori apr/L-File for GNSS site position and DOMES info (requires -sti).
44
45   -r RELATIVE, --relative RELATIVE
46     Reconstruct relative subfolders. Provide the parent folder to be replaced with
  ↪ OUTPUTFOLDER.
47
48   -nh, --no_hatanaka
```

49 Skip Hatanaka compression. See also `-c none`.

50

51 `-c {gz,Z,none}, --compression {gz,Z,none}`

52 Low-level compression: 'gz' (default, IGS standard), 'Z', or 'none'.

53

54 `-l, --longname`

55 Force long RINEX filename convention (gzip). Exclusive with `--shortname`.

56

57 `-sh, --shortname`

58 Force short RINEX filename convention. Exclusive with `--longname`.

59

60 `-fs, --force_sitelog`

61 With a single sitelog: force sitelog values even if mismatch.

62 With multiple sitelogs: skip badly formatted ones.

63

64 `-fc, --force_fake_coords`

65 With GAMIT station.info but no L-File coords, assign fake (0,0,0).

66

67 `-fr, --force_rnx_load`

68 Force load of RINEX even if filename is non-standard.

69

70 `-ig, --ignore`

71 Ignore firmware changes between instrumentation periods.

72

73 `-a, --alone`

74 Treat INPUT as a single RINEX file (not a list).

75

76 `-ol OUTPUT_LOGS, --output_logs OUTPUT_LOGS`

77 Output log folder. Defaults to OUTPUTFOLDER.

78

79 `-w, --write`

80 Write output lists (version, sample rate, file period).

81

82 `-v, --verbose`

83 Print file metadata before and after modification.

84

85 `-t, --sort`

86 Sort the RINEX input list.

87

88 `-u, --full_history`

89 Add full station history in RINEX header comments.

90

91 `-fns {basic,flex,exact}, --filename_style {basic,flex,exact}`

92 RINEX filename style (default: basic).

93 * basic: strict filename period (01H or 01D), IGS compatible.

94 e.g.: FNG000GLP_R_20242220000_01D_30S_M0.crx.gz

95 * flex: period matches data content, may be odd (e.g. 07H, 14H).

96 Rounded to the hour.

97 e.g.: FNG000GLP_R_20242221800_06H_30S_M0.crx.gz

98 * exact: start time = first epoch. For splicing.

99 e.g.: FNG000GLP_R_20242221829_06H_30S_M0.crx.gz

100

101 `-mp MULTI_PROCESS, --multi_process MULTI_PROCESS`

102 Number of parallel processes (default: 1).

103

104 `-d, --debug`

105 Debug mode. Stop on error.

106

107 `-rm, --remove`

108 Remove input RINEX if output was written correctly. (Dangerous)

```
109 -krr, --keep_rnx_rec
110     Keep original receiver header record. External metadata not applied.
111
112
113 RinexMod 3.7.6 - GNU GPL v3 - P. Sakic et al. - IPGP-OVS -
↪ https://github.com/IPGP/rinexmod
```

S2 autorino's main configuration file example

```
1 # Configuration file for the Autorino project.
2 # This YAML file defines the structure and settings for the environment, station, and
  ↪ sessions.
3
4 cfgfile_version: 20.2 # Version of the configuration file format.
5
6 ##### DEFINITION OF THE ENVIRONMENT
7 environment:
8   conv_software_paths:
9     convbin : "convbin" # Path to RTKLIB converter.
10    mdb2rinex : "mdb2rinex" # Path to Leica converter.
11    sbf2rinex : "sbf2rinex" # Path to Septentrio converter.
12    tps2rinex : "tps2rinex.exe" # Path to Topcon converter.
13    ### Trimble
14    t0xconvert : "t0xConvert" # Path to Trimble official converter (case-sensitive).
15    trm2rinex : "trm2rinex:cli-light" # Path to Trimble unofficial docker converter.
16    runpkr00 : "runpkr00" # Path to Trimble legacy converter for TEQC.
17    ### RINEX handling
18    convert0 : "ConvertoCPP" # Path to ConvertoCPP tool.
19    gfzrnex : "gfzrnex" # Path to GFZRNEX tool.
20    teqc : "teqc" # Path to TEQC tool.
21  general:
22    log_level: "DEBUG" # Logging level for the application.
23    trimble_default_software: "trm2rinex" # Default Trimble converter key (lowercase).
24    cfg_merge_strategy: "replace" # Strategy to merge configuration files ('replace' or
  ↪ 'additive').
25
26 ##### DEFINITION OF THE STATION COMMON INFORMATION FOR THE WHOLE NETWORK
27 station:
28   site:
29     operator: "MY_OPERATOR_NAME" # Name of the site operator.
30     agency: "MY_AGENCY_NAME" # Name of the agency managing the site.
31     country: "France" # Country name in ISO 3166 format.
32     sitelog_path: <$HOME>/sitelogs/ # Path to site logs (file or directory).
33  sessions:
34    session_01D30S:
35      general:
36        active: True # Indicates if the session is active.
37        session_name: "01D30S" # Free name of the session (must be the same as the
  ↪ 'session_XXXXX' key suffix).
38        data_frequency: "30S" # RINEX convention (XXC - 100 Hertz, XXZ - Hertz, XXS -
  ↪ Seconds, XXM - Minutes, XXH - Hours, XXD - Days, XXU - Unspecified)
39        tmp_dir_parent: '/<$HOME>/autorino_workflow/tmp' # Parent directory for
  ↪ temporary files.
40        tmp_dir_structure: '' # Structure for temporary directories.
41        log_dir_parent: '/<$HOME>/autorino_workflow/log' # Parent directory for log
  ↪ files.
42        log_dir_structure: '' # Structure for log directories.
43    epoch_range:
44      epoch1: '10 days ago UTC' # Start of the epoch range.
45      epoch2: 'yesterday at 23:59 UTC' # End of the epoch range.
46      period: "1D" # Time period using Pandas offset aliases.
47      round_method: "floor" # Method to round timestamps.
48      tz: 'UTC' # Timezone for the session.
49    steps:
50      download: ##### DOWNLOAD STEP DEFINITION
51        active : True # Indicates if the download step is active.
```

```

52 # inp_dir_parent, inp_dir_structure & inp_file_regex are defined in sites
53 ↪ cfg.
54 out_dir_parent: '/<$HOME>/autorino_workflow/raw' # Parent directory for
55 ↪ output files.
56 out_dir_structure: '<SITE_ID9>/%Y/%j' # Structure for output directories.
57 epoch_range:
58 FROM_SESSION # Use the session's epoch range.
59 options:
60 force: False # Force re-download of files.
61 remote_find_method: ask # Method to find remote files ('ask' or 'guess').
62 # ask: Retrieve the actual remote file list (e.g., for FTP).
63 # guess: Pre-generate remote file paths (e.g., for HTTP).
64 invalidate_small_local_files: False # Invalidate small local files.
65 timeout: 30 # Timeout for remote connections in seconds.
66 max_try: 4 # Maximum number of retries for remote connections.
67 sleep_time: 5 # Sleep time between retries in seconds.
68 ping_disable: False # Disable preliminary ping on remote servers.
69 ping_timeout: 5 # Timeout for pinging remote servers in seconds.
70 ping_max_try: 4 # Maximum number of ping retries.
71 convert: ##### CONVERT STEP DEFINITION
72 active : True # Indicates if the convert step is active.
73 inp_dir_parent: '/<$HOME>/autorino_workflow/raw' # Parent directory for input
74 ↪ files.
75 inp_dir_structure: '<SITE_ID9>/%Y/%j' # Structure for input directories.
76 inp_file_regex: ".*<SITE_ID4>.*" # Regular expression for input file names.
77 out_dir_parent: '/<$HOME>/autorino_workflow/rnx' # Parent directory for
78 ↪ output files.
79 out_dir_structure: '<SITE_ID9>/%Y/%j' # Structure for output directories.
80 epoch_range:
81 FROM_SESSION # Use the session's epoch range.
82 options:
83 force: False # Force re-conversion of files.
84 converter: auto # Converter to use (auto-detect).
85 # Custom regex to catch converted temporary files, default (empty) is
86 ↪ regular most-common patterns.
87 conv_regex_custom_main: "" # Custom regex to catch converted temporary main
88 ↪ file.
89 conv_regex_custom_annex: "" # Custom regex to catch converted temporary
90 ↪ annex files.
91 rinexmod_options:
92 compression: "gz" # Compression format for RINEX files.
93 longname: True # Use long file names.
94 force_rnx_load: True # Force loading of RINEX files.
95 verbose: False # Enable verbose output.
96 filename_style: basic # Style for file names.
97 full_history: True # Keep full history of operations.

```

S3 autorino_cfgfile_run synopsis

```
1 usage: autorino_cfgfile_run [-h] -c CONFIG
2   [-i INCLUDE_CONFIG [INCLUDE_CONFIG ...]]
3   [-s START] [-e END] [-p PERIOD]
4   [-si SITES_LIST [SITES_LIST ...]] [-xsi]
5   [-sp {download,convert,split,splice,rinexmod}
6     [{download,convert,split,splice,rinexmod} ...]]
7   [-xsp] [-f]
8
9 Assisted Unloading, Treatment and Organization of RINEX observations
10
11 options:
12   -h, --help
13     show this help message and exit
14
15   -c CONFIG, --config CONFIG
16     Input site configuration file or directory of
17     configuration files. If a directory is provided,
18     all files ending with '.yml' will be used.
19
20   -i INCLUDE_CONFIG [INCLUDE_CONFIG ...],
21     --include_config INCLUDE_CONFIG [INCLUDE_CONFIG ...]
22     Include configuration files (for dev/advanced use).
23     Overrides the `include` section of the main config.
24
25   -s START, --start START
26     Start date for the epoch range. Formats:
27     * 'yesterday', '10 days ago'
28     * YYYY-DDD (e.g. 2025-140)
29     * YYYY-MM-DD (e.g. 2025-05-20)
30     Also accepts lists or file paths.
31     Default: None.
32
33   -e END, --end END
34     End date for the epoch range. Formats:
35     * 'yesterday', '10 days ago'
36     * YYYY-DDD (e.g. 2025-140)
37     * YYYY-MM-DD (e.g. 2025-05-20)
38     Default: None.
39
40   -p PERIOD, --period PERIOD
41     Sampling period: '1D' (daily), '1H' (hourly),
42     '15M' (15 minutes). Default: '1D'.
43
44   -si SITES_LIST [SITES_LIST ...],
45     --sites_list SITES_LIST [SITES_LIST ...]
46     List of site identifiers to process. Default: None.
47
48   -xsi, --exclude_sites
49     Opposite of --sites_list. Default: False.
50
51   -sp {download,convert,split,splice,rinexmod}
52     [{download,convert,split,splice,rinexmod} ...],
53     --steps_list {download,convert,split,splice,rinexmod}
54     [{download,convert,split,splice,rinexmod} ...]
55     Steps to be executed. Default: all steps.
56
57   -xsp, --exclude_steps
58     Opposite of --steps_list. Default: False.
```

```
59 -f, --force
60 Execute steps even if outputs exist. Overrides
61 'force' in config. Default: False.
62
63
64 Examples:
65 * Run all config files in a directory:
66   autorino_cfgfile_run -c cfgfiles_dir
67
68 * Run a site config for 10 days starting 2025-01-01:
69   autorino_cfgfile_run -c site_cfg.yml \
70     -s 2025-01-01 -e '10 days ago'
71
72 * Run only download+convert for selected sites:
73   autorino_cfgfile_run -c cfgfiles_dir \
74     -si HOUZ00GLP BORG00REU \
75     -sp download convert
```

S4 autorino_convert_rnx synopsis

```
1 usage: autorino_convert_rnx [-h] -i INP_RAWS [INP_RAWS ...] -o OUT_DIR
2   [-t OUT_STRUCTURE] [-m METADATA] [-frnx] [-fraw] [-l]
3   [-tmp TMP_DIR] [-log LOG_DIR] [-rimo RINEXMOD_OPTIONS]
4   [-ro RAW_OUT_DIR] [-rt RAW_OUT_STRUCTURE]
5   [-p PROCESSES] [-fpt]
6
7 Convert RAW files to RINEX.
8
9 options:
10  -h, --help
11     show this help message and exit
12
13  -i INP_RAWS [INP_RAWS ...],
14     --inp_raws INP_RAWS [INP_RAWS ...]
15     Input RAW files to convert. Possible inputs:
16     * single RAW file path
17     * comma-separated list of RAW paths
18     * text file with RAW paths (requires --list_file_input)
19     * directory containing RAW files
20
21  -o OUT_DIR, --out_dir OUT_DIR
22     Output directory for converted files.
23
24  -t OUT_STRUCTURE, --out_structure OUT_STRUCTURE
25     Subdirectory structure inside out_dir.
26     Examples: '<SITE_ID4>/%Y/', '%Y/%j/'.
27     Default: '%Y/%j/'.
28
29  -m METADATA, --metadata METADATA
30     Metadata for RINEX files. Can be:
31     * list of sitelog file paths
32     * single sitelog file path
33     * directory of sitelogs
34
35  -frnx, --force_rnx
36     Force RINEX conversion even if outputs exist.
37
38  -fraw, --force_raw
39     Force RAW archiving even if outputs exist.
40
41  -l, --list_file_input
42     Interpret input as a text file listing RAW paths.
43
44  -tmp TMP_DIR, --tmp_dir TMP_DIR
45     Temporary directory for conversion.
46     Default: <$HOME>/autorino_workflow/tmp.
47
48  -log LOG_DIR, --log_dir LOG_DIR
49     Directory for logs.
50     Default: <$HOME>/autorino_workflow/log.
51
52  -rimo RINEXMOD_OPTIONS,
53     --rinexmod_options RINEXMOD_OPTIONS
54     Options for modifying RINEX files (dict as string).
55     Example: '{longname: False, filename_style: basic}'.
56     Default: None.
57
58  -ro RAW_OUT_DIR, --raw_out_dir RAW_OUT_DIR
```

```
59     Directory where RAW files will be archived.
60     No deletion occurs.
61
62 -rt RAW_OUT_STRUCTURE, --raw_out_structure RAW_OUT_STRUCTURE
63     Structure for RAW archiving. Defaults to same as
64     output directory.
65
66 -p PROCESSES, --processes PROCESSES
67     Number of parallel processes. Default: 1.
68
69 -fpt, --filter_prev_tables
70     Skip files already converted (uses tmp tables).
```

S5 Log exemples

S5.1 Log exemple for a *download* step

```
251231T01:32:14.325|I|read_env      |autorino & rinexmod version: 2.3.1-beta0 & 3.7.2
251231T01:32:14.325|I|read_env      |Loading environment configfile:
↪ /home/sysop/py_ovs/autorino_configfiles/configfiles/OVPF//main/autorino_main_cfg_ovpf.yml
251231T01:32:14.659|I|load_cfg       |>>>>>> Read configfile:
↪ /home/sysop/py_ovs/autorino_configfiles/configfiles/OVPF//sites/autorino_site_cfg_ovpf_ENCG00REU.yml
251231T01:32:14.673|I|sitlgs2mda_objs|**** 41 sitelogs detected (in /mnt/DonneesTemporaires/Geodesy/GNSS/sitelogs)
251231T01:32:14.876|I|sitlgs2mda_objs|**** 41 most recent sitelogs selected
251231T01:32:14.911|I|run_steps      |2 steps will be run [DownloadGnss ENCG00REU/from 2025-12-21T00:00:00Z to 2025-12-30T00:00:00Z, period 1D/10 elts,
↪ ConvertGnss ENCG00REU/from 2025-12-21T00:00:00Z to 2025-12-30T00:00:00Z, period 1D/10 elts]
251231T01:32:14.911|I|download      |>>>>>> RAW files download
251231T01:32:14.929|I|ping_remote   |Remote server 10.20.34.4 is reachable. (4 ms)
251231T01:32:15.199|D|ask_remote_raw |regex to filter remote files (aliases not translated yet): <SITE_ID4>%j0.%y_
251231T01:32:15.238|D|ask_remote_raw |1 remote files found on rec: ['10.20.34.4/DSK1/SSN/LOG1_A/25355/ENCG3550.25_']
251231T01:32:16.673|D|ask_remote_raw |1 remote files found on rec: ['10.20.34.4/DSK1/SSN/LOG1_A/25356/ENCG3560.25_']
251231T01:32:16.721|D|ask_remote_raw |1 remote files found on rec: ['10.20.34.4/DSK1/SSN/LOG1_A/25357/ENCG3570.25_']
251231T01:32:16.747|D|ask_remote_raw |1 remote files found on rec: ['10.20.34.4/DSK1/SSN/LOG1_A/25358/ENCG3580.25_']
251231T01:32:16.773|D|ask_remote_raw |1 remote files found on rec: ['10.20.34.4/DSK1/SSN/LOG1_A/25359/ENCG3590.25_']
251231T01:32:16.823|D|ask_remote_raw |1 remote files found on rec: ['10.20.34.4/DSK1/SSN/LOG1_A/25360/ENCG3600.25_']
251231T01:32:16.878|D|ask_remote_raw |1 remote files found on rec: ['10.20.34.4/DSK1/SSN/LOG1_A/25361/ENCG3610.25_']
251231T01:32:16.940|D|ask_remote_raw |1 remote files found on rec: ['10.20.34.4/DSK1/SSN/LOG1_A/25362/ENCG3620.25_']
251231T01:32:16.972|D|ask_remote_raw |1 remote files found on rec: ['10.20.34.4/DSK1/SSN/LOG1_A/25363/ENCG3630.25_']
251231T01:32:17.089|D|ask_remote_raw |1 remote files found on rec: ['10.20.34.4/DSK1/SSN/LOG1_A/25364/ENCG3640.25_']
251231T01:32:17.097|I|ask_remote_raw |nbr remote files found on rec: 10
251231T01:32:17.099|D|ask_local_raw  |local file asked: /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/355/ENCG3550.25_
251231T01:32:17.100|D|ask_local_raw  |local file asked: /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/356/ENCG3560.25_
251231T01:32:17.101|D|ask_local_raw  |local file asked: /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/357/ENCG3570.25_
251231T01:32:17.102|D|ask_local_raw  |local file asked: /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/358/ENCG3580.25_
251231T01:32:17.104|D|ask_local_raw  |local file asked: /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/359/ENCG3590.25_
251231T01:32:17.105|D|ask_local_raw  |local file asked: /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/360/ENCG3600.25_
251231T01:32:17.106|D|ask_local_raw  |local file asked: /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/361/ENCG3610.25_
251231T01:32:17.107|D|ask_local_raw  |local file asked: /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/362/ENCG3620.25_
251231T01:32:17.108|D|ask_local_raw  |local file asked: /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/363/ENCG3630.25_
251231T01:32:17.109|D|ask_local_raw  |local file asked: /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/364/ENCG3640.25_
251231T01:32:17.109|I|ask_local_raw  |nbr local raw files asked: 10
251231T01:32:17.127|I|download      |1/ 10 files will be downloaded, 9/ 10 files are excluded
251231T01:32:17.131|I|print_table   |DownloadGnss ENCG00REU/from 2025-12-21T00:00:00Z to 2025-12-30T00:00:00Z, period 1D
```

	fname	site	epoch_srt	epoch_end	ok_inp	ok_out	fpath_inp	fpath_out
	↪ size_inp	size_out	note					
0	ENCG3550.25_	ENCG00REU	25-12-21 00:00:00	25-12-21 23:59:59	False	True	ftp://10.20.34...55/ENCG3550.25_	/mnt/DonneesTem..55/ENCG3550.25_
	↪ NaN	12621312						
1	ENCG3560.25_	ENCG00REU	25-12-22 00:00:00	25-12-22 23:59:59	False	True	ftp://10.20.34...56/ENCG3560.25_	/mnt/DonneesTem..56/ENCG3560.25_
	↪ NaN	12561708						
2	ENCG3570.25_	ENCG00REU	25-12-23 00:00:00	25-12-23 23:59:59	False	True	ftp://10.20.34...57/ENCG3570.25_	/mnt/DonneesTem..57/ENCG3570.25_
	↪ NaN	12732600						
3	ENCG3580.25_	ENCG00REU	25-12-24 00:00:00	25-12-24 23:59:59	False	True	ftp://10.20.34...58/ENCG3580.25_	/mnt/DonneesTem..58/ENCG3580.25_
	↪ NaN	12586772						
4	ENCG3590.25_	ENCG00REU	25-12-25 00:00:00	25-12-25 23:59:59	False	True	ftp://10.20.34...59/ENCG3590.25_	/mnt/DonneesTem..59/ENCG3590.25_
	↪ NaN	12485876						
5	ENCG3600.25_	ENCG00REU	25-12-26 00:00:00	25-12-26 23:59:59	False	True	ftp://10.20.34...60/ENCG3600.25_	/mnt/DonneesTem..60/ENCG3600.25_
	↪ NaN	12605996						
6	ENCG3610.25_	ENCG00REU	25-12-27 00:00:00	25-12-27 23:59:59	False	True	ftp://10.20.34...61/ENCG3610.25_	/mnt/DonneesTem..61/ENCG3610.25_
	↪ NaN	12698788						
7	ENCG3620.25_	ENCG00REU	25-12-28 00:00:00	25-12-28 23:59:59	False	True	ftp://10.20.34...62/ENCG3620.25_	/mnt/DonneesTem..62/ENCG3620.25_
	↪ NaN	12633836						
8	ENCG3630.25_	ENCG00REU	25-12-29 00:00:00	25-12-29 23:59:59	False	True	ftp://10.20.34...63/ENCG3630.25_	/mnt/DonneesTem..63/ENCG3630.25_
	↪ NaN	12648316						
9	ENCG3640.25_	ENCG00REU	25-12-30 00:00:00	25-12-30 23:59:59	True	False	ftp://10.20.34...64/ENCG3640.25_	/mnt/DonneesTem..64/ENCG3640.25_
	↪ NaN	NaN						

```

251231T01:32:17.132|D|check_lockfile|Lock free for //home/sysop/autorino_workflow/tmp/wifi_lock
251231T01:32:17.133|I|create_lockfile|Lock acquired for //home/sysop/autorino_workflow/tmp/wifi_lock
251231T01:32:17.134|I|mono_ok_check|fetch skipped (output already exists): ftp://10.20.34.4/DSK1/SSN/LOG1_A/25355/ENCG3550.25_
251231T01:32:17.134|I|mono_ok_check|fetch skipped (output already exists): ftp://10.20.34.4/DSK1/SSN/LOG1_A/25356/ENCG3560.25_
251231T01:32:17.134|I|mono_ok_check|fetch skipped (output already exists): ftp://10.20.34.4/DSK1/SSN/LOG1_A/25357/ENCG3570.25_
251231T01:32:17.135|I|mono_ok_check|fetch skipped (output already exists): ftp://10.20.34.4/DSK1/SSN/LOG1_A/25358/ENCG3580.25_
251231T01:32:17.135|I|mono_ok_check|fetch skipped (output already exists): ftp://10.20.34.4/DSK1/SSN/LOG1_A/25359/ENCG3590.25_
251231T01:32:17.136|I|mono_ok_check|fetch skipped (output already exists): ftp://10.20.34.4/DSK1/SSN/LOG1_A/25360/ENCG3600.25_
251231T01:32:17.136|I|mono_ok_check|fetch skipped (output already exists): ftp://10.20.34.4/DSK1/SSN/LOG1_A/25361/ENCG3610.25_
251231T01:32:17.136|I|mono_ok_check|fetch skipped (output already exists): ftp://10.20.34.4/DSK1/SSN/LOG1_A/25362/ENCG3620.25_
251231T01:32:17.137|I|mono_ok_check|fetch skipped (output already exists): ftp://10.20.34.4/DSK1/SSN/LOG1_A/25363/ENCG3630.25_
251231T01:32:17.137|I|mono_fetch|>>>> fetch remote raw file: ENCG3640.25_
ENCG3640.25_: 0%| | 0.00/12.5M [00:00<?, ?B/s]
ENCG3640.25_: 0%| | 5.37k/12.5M [00:00<04:15, 48.9kB/s]
ENCG3640.25_: 0%| | 12.6k/12.5M [00:00<03:40, 56.7kB/s]
<0% to 100% progression>
ENCG3640.25_: 100%||||||| 12.5M/12.5M [03:25<00:00, 70.2kB/s]
ENCG3640.25_: 100%||||||| 12.5M/12.5M [03:26<00:00, 67.0kB/s]
ENCG3640.25_: 100%||||||| 12.5M/12.5M [03:26<00:00, 60.6kB/s]
251231T01:35:43.591|I|print_table|DownloadGnss ENCG00REU/from 2025-12-21T00:00:00Z to 2025-12-30T00:00:00Z, period 1D

```

	fname	site	epoch_srt	epoch_end	ok_inp	ok_out	fpath_inp	fpath_out
0	ENCG3550.25_	ENCG00REU	25-12-21 00:00:00	25-12-21 23:59:59	False	True	ftp://10.20.34...55/ENCG3550.25_	/mnt/DonneesTem..55/ENCG3550.25_
	↪ NaN	12621312						
1	ENCG3560.25_	ENCG00REU	25-12-22 00:00:00	25-12-22 23:59:59	False	True	ftp://10.20.34...56/ENCG3560.25_	/mnt/DonneesTem..56/ENCG3560.25_
	↪ NaN	12561708						
2	ENCG3570.25_	ENCG00REU	25-12-23 00:00:00	25-12-23 23:59:59	False	True	ftp://10.20.34...57/ENCG3570.25_	/mnt/DonneesTem..57/ENCG3570.25_
	↪ NaN	12732600						
3	ENCG3580.25_	ENCG00REU	25-12-24 00:00:00	25-12-24 23:59:59	False	True	ftp://10.20.34...58/ENCG3580.25_	/mnt/DonneesTem..58/ENCG3580.25_
	↪ NaN	12586772						
4	ENCG3590.25_	ENCG00REU	25-12-25 00:00:00	25-12-25 23:59:59	False	True	ftp://10.20.34...59/ENCG3590.25_	/mnt/DonneesTem..59/ENCG3590.25_
	↪ NaN	12485876						
5	ENCG3600.25_	ENCG00REU	25-12-26 00:00:00	25-12-26 23:59:59	False	True	ftp://10.20.34...60/ENCG3600.25_	/mnt/DonneesTem..60/ENCG3600.25_
	↪ NaN	12605996						
6	ENCG3610.25_	ENCG00REU	25-12-27 00:00:00	25-12-27 23:59:59	False	True	ftp://10.20.34...61/ENCG3610.25_	/mnt/DonneesTem..61/ENCG3610.25_
	↪ NaN	12698788						
7	ENCG3620.25_	ENCG00REU	25-12-28 00:00:00	25-12-28 23:59:59	False	True	ftp://10.20.34...62/ENCG3620.25_	/mnt/DonneesTem..62/ENCG3620.25_
	↪ NaN	12633836						
8	ENCG3630.25_	ENCG00REU	25-12-29 00:00:00	25-12-29 23:59:59	False	True	ftp://10.20.34...63/ENCG3630.25_	/mnt/DonneesTem..63/ENCG3630.25_
	↪ NaN	12648316						
9	ENCG3640.25_	ENCG00REU	25-12-30 00:00:00	25-12-30 23:59:59	True	True	ftp://10.20.34...64/ENCG3640.25_	/mnt/DonneesTem..64/ENCG3640.25_
	↪ NaN	NaN						

251231T01:35:43.593|W|run_steps |step convert skipped, not selected in ['download']

251231T01:35:43.594|D|exit_code |Exit code returned: 0, DownloadGnss ENCG00REU/from 2025-12-21T00:00:00Z to 2025-12-30T00:00:00Z, period 1D/10 elts

251231T01:35:43.595|D|exit_code |Exit code returned: 0, ConvertGnss ENCG00REU/from 2025-12-21T00:00:00Z to 2025-12-30T00:00:00Z, period 1D/10 elts

S5.2 Log exemple for a *convert* step

```

251231T01:35:47.059|I|read_env |autorino & rinexmod version: 2.3.1-beta0 & 3.7.2
251231T01:35:47.059|I|read_env |Loading environment configfile:
↪ /home/sysop/py_ovs/autorino_configfiles/configfiles/OVPF//main/autorino_main_cfg_ovpf.yml
251231T01:35:47.373|I|load_cfg |>>>>>> Read configfile:
↪ /home/sysop/py_ovs/autorino_configfiles/configfiles/OVPF//sites/autorino_site_cfg_ovpf_ENCG00REU.yml
251231T01:35:47.386|I|sitlgs2mda_objs|**** 41 sitelogs detected (in /mnt/DonneesTemporaires/Geodesy/GNSS/sitelogs)
251231T01:35:47.572|I|sitlgs2mda_objs|**** 41 most recent sitelogs selected
251231T01:35:47.607|I|run_steps |2 steps will be run [DownloadGnss ENCG00REU/from 2025-12-21T00:00:00Z to 2025-12-30T00:00:00Z, period 1D/10 elts,
↪ ConvertGnss ENCG00REU/from 2025-12-21T00:00:00Z to 2025-12-30T00:00:00Z, period 1D/10 elts]
251231T01:35:47.607|W|run_steps |step download skipped, not selected in ['convert']
251231T01:35:47.607|I|run_steps |>>>>>> Load table for step convert
251231T01:35:47.611|D|load_tab_inpdire|1 files found in /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/355, regex: .*ENCG.*

```

```

251231T01:35:47.612|D|load_tab_inpdir|1 files found in /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/356, regex: .*ENCG.*
251231T01:35:47.613|D|load_tab_inpdir|1 files found in /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/357, regex: .*ENCG.*
251231T01:35:47.615|D|load_tab_inpdir|1 files found in /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/358, regex: .*ENCG.*
251231T01:35:47.616|D|load_tab_inpdir|1 files found in /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/359, regex: .*ENCG.*
251231T01:35:47.617|D|load_tab_inpdir|1 files found in /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/360, regex: .*ENCG.*
251231T01:35:47.618|D|load_tab_inpdir|1 files found in /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/361, regex: .*ENCG.*
251231T01:35:47.619|D|load_tab_inpdir|1 files found in /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/362, regex: .*ENCG.*
251231T01:35:47.620|D|load_tab_inpdir|1 files found in /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/363, regex: .*ENCG.*
251231T01:35:47.621|D|load_tab_inpdir|1 files found in /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/364, regex: .*ENCG.*
251231T01:35:47.624|I|convert      |>>>>> RAW > RINEX files conversion
251231T01:35:47.635|D|mono_guess_rnx |local RINEX file guessed:
  → /mnt/DonneesTemporaires/Geodesy/GNSS/RINEX/01D30S/PF/2025/355/ENCG00REU_R_20253550000_01D_30S_MO.crx.gz
251231T01:35:47.635|D|mono_guess_rnx |local RINEX file guessed:
  → /mnt/DonneesTemporaires/Geodesy/GNSS/RINEX/01D30S/PF/2025/356/ENCG00REU_R_20253560000_01D_30S_MO.crx.gz
251231T01:35:47.636|D|mono_guess_rnx |local RINEX file guessed:
  → /mnt/DonneesTemporaires/Geodesy/GNSS/RINEX/01D30S/PF/2025/357/ENCG00REU_R_20253570000_01D_30S_MO.crx.gz
251231T01:35:47.637|D|mono_guess_rnx |local RINEX file guessed:
  → /mnt/DonneesTemporaires/Geodesy/GNSS/RINEX/01D30S/PF/2025/358/ENCG00REU_R_20253580000_01D_30S_MO.crx.gz
251231T01:35:47.637|D|mono_guess_rnx |local RINEX file guessed:
  → /mnt/DonneesTemporaires/Geodesy/GNSS/RINEX/01D30S/PF/2025/359/ENCG00REU_R_20253590000_01D_30S_MO.crx.gz
251231T01:35:47.638|D|mono_guess_rnx |local RINEX file guessed:
  → /mnt/DonneesTemporaires/Geodesy/GNSS/RINEX/01D30S/PF/2025/360/ENCG00REU_R_20253600000_01D_30S_MO.crx.gz
251231T01:35:47.638|D|mono_guess_rnx |local RINEX file guessed:
  → /mnt/DonneesTemporaires/Geodesy/GNSS/RINEX/01D30S/PF/2025/361/ENCG00REU_R_20253610000_01D_30S_MO.crx.gz
251231T01:35:47.639|D|mono_guess_rnx |local RINEX file guessed:
  → /mnt/DonneesTemporaires/Geodesy/GNSS/RINEX/01D30S/PF/2025/362/ENCG00REU_R_20253620000_01D_30S_MO.crx.gz
251231T01:35:47.639|D|mono_guess_rnx |local RINEX file guessed:
  → /mnt/DonneesTemporaires/Geodesy/GNSS/RINEX/01D30S/PF/2025/363/ENCG00REU_R_20253630000_01D_30S_MO.crx.gz
251231T01:35:47.640|D|mono_guess_rnx |local RINEX file guessed:
  → /mnt/DonneesTemporaires/Geodesy/GNSS/RINEX/01D30S/PF/2025/364/ENCG00REU_R_20253640000_01D_30S_MO.crx.gz
251231T01:35:47.640|I|guess_local_rnx|nbr local RINEX files guessed: 10
251231T01:35:47.658|I|convert      | 1/ 10 files will be converted, 9/ 10 files are excluded
251231T01:35:47.661|I|print_table  |ConvertGnss ENCG00REU/from 2025-12-21T00:00:00Z to 2025-12-30T00:00:00Z, period 1D
      fname      site      epoch_srt      epoch_end ok_inp ok_out      fpath_inp      fpath_out
      → size_inp size_out note
0 ENCG3550.25_ ENCG00REU 25-12-21 00:00:00 25-12-22 00:00:00 False True /mnt/DonneesTem..55/ENCG3550.25_ /mnt/DonneesTem..D_30S_MO.crx.gz
  → 12621312 4076876 NaN
1 ENCG3560.25_ ENCG00REU 25-12-22 00:00:00 25-12-23 00:00:00 False True /mnt/DonneesTem..56/ENCG3560.25_ /mnt/DonneesTem..D_30S_MO.crx.gz
  → 12561708 4058721 NaN
2 ENCG3570.25_ ENCG00REU 25-12-23 00:00:00 25-12-24 00:00:00 False True /mnt/DonneesTem..57/ENCG3570.25_ /mnt/DonneesTem..D_30S_MO.crx.gz
  → 12732600 4139744 NaN

```

```

3 ENCG3580.25_ ENCG00REU 25-12-24 00:00:00 25-12-25 00:00:00 False True /mnt/DonneesTem..58/ENCG3580.25_ /mnt/DonneesTem..D_30S_MO.crx.gz
↳ 12586772 4091774 NaN
4 ENCG3590.25_ ENCG00REU 25-12-25 00:00:00 25-12-26 00:00:00 False True /mnt/DonneesTem..59/ENCG3590.25_ /mnt/DonneesTem..D_30S_MO.crx.gz
↳ 12485876 4028059 NaN
5 ENCG3600.25_ ENCG00REU 25-12-26 00:00:00 25-12-27 00:00:00 False True /mnt/DonneesTem..60/ENCG3600.25_ /mnt/DonneesTem..D_30S_MO.crx.gz
↳ 12605996 4075193 NaN
6 ENCG3610.25_ ENCG00REU 25-12-27 00:00:00 25-12-28 00:00:00 False True /mnt/DonneesTem..61/ENCG3610.25_ /mnt/DonneesTem..D_30S_MO.crx.gz
↳ 12698788 4124825 NaN
7 ENCG3620.25_ ENCG00REU 25-12-28 00:00:00 25-12-29 00:00:00 False True /mnt/DonneesTem..62/ENCG3620.25_ /mnt/DonneesTem..D_30S_MO.crx.gz
↳ 12633836 4110474 NaN
8 ENCG3630.25_ ENCG00REU 25-12-29 00:00:00 25-12-30 00:00:00 False True /mnt/DonneesTem..63/ENCG3630.25_ /mnt/DonneesTem..D_30S_MO.crx.gz
↳ 12648316 4120302 NaN
9 ENCG3640.25_ ENCG00REU 25-12-30 00:00:00 25-12-31 00:00:00 True False /mnt/DonneesTem..64/ENCG3640.25_ /mnt/DonneesTem..D_30S_MO.crx.gz
↳ 12491612 NaN NaN
251231T01:35:47.661|I|mono_ok_check |conversion skipped (output already exists): /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/355/ENCG3550.25_
251231T01:35:47.662|I|mono_ok_check |conversion skipped (output already exists): /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/356/ENCG3560.25_
251231T01:35:47.662|I|mono_ok_check |conversion skipped (output already exists): /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/357/ENCG3570.25_
251231T01:35:47.662|I|mono_ok_check |conversion skipped (output already exists): /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/358/ENCG3580.25_
251231T01:35:47.663|I|mono_ok_check |conversion skipped (output already exists): /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/359/ENCG3590.25_
251231T01:35:47.663|I|mono_ok_check |conversion skipped (output already exists): /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/360/ENCG3600.25_
251231T01:35:47.663|I|mono_ok_check |conversion skipped (output already exists): /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/361/ENCG3610.25_
251231T01:35:47.663|I|mono_ok_check |conversion skipped (output already exists): /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/362/ENCG3620.25_
251231T01:35:47.664|I|mono_ok_check |conversion skipped (output already exists): /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/363/ENCG3630.25_
251231T01:35:47.664|I|convert |>>> input raw file for conversion: ENCG3640.25_
251231T01:35:47.665|I|convert |extension/converter: .25_/auto
251231T01:35:47.665|W|prep_rgx_custom|Error: both main&annex custom regex for converted file must be provided: None & None
251231T01:35:47.665|W|prep_rgx_custom|No custom regex will be used.
251231T01:35:47.682|D|converter_run |input file: /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/364/ENCG3640.25_
251231T01:35:47.682|I|converter_run |input file for conversion: /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/364/ENCG3640.25_
251231T01:35:47.683|D|_convert_select|brand & converter selected: Septentrio, sbf2rin
251231T01:35:47.683|D|converter_run |conversion command: sbf2rin -f /mnt/DonneesTemporaires/Geodesy/GNSS/RAW/01D30S/PF/2025/364/ENCG3640.25_ -o
↳ //home/sysop/autorino_workflow/tmp/030_converted/ENCG3640.25_.rnx_sbf2rin -s
251231T01:35:49.159|D|converter_run |Conversion done ( 1.4750 sec.). Converter's output:
251231T01:35:49.159|D|converter_run |b'Creating RINEX file: done'
251231T01:35:49.159|D|converter_run |regex for the converted files (main/annex.): re.compile('ENCG3640.25_'),re.compile('ENCG3640.25_')
251231T01:35:49.159|I|converter_run |✓ conversion OK ( 1.4750 sec.), main file/size:
↳ //home/sysop/autorino_workflow/tmp/030_converted/ENCG3640.25_.rnx_sbf2rin 37019434
251231T01:35:49.256|I|rinexmod |# Inp. file: //home/sysop/autorino_workflow/tmp/030_converted/ENCG3640.25_.rnx_sbf2rin
251231T01:35:52.453|I|rinexmod |# Out. file: //home/sysop/autorino_workflow/tmp/040_rinexmoded/ENCG00REU_R_20253640000_01D_30S_MO.crx.gz
251231T01:35:52.553|D|move_copy_core |file moved to final destination:
↳ /mnt/DonneesTemporaires/Geodesy/GNSS/RINEX/01D30S/PF/2025/364/ENCG00REU_R_20253640000_01D_30S_MO.crx.gz
251231T01:35:52.557|D|remov_tmp_files|remove tmp converted RINEX file: //home/sysop/autorino_workflow/tmp/030_converted/ENCG3640.25_.rnx_sbf2rin

```

251231T01:35:52.562|D|exit_code |Exit code returned: 0, DownloadGnss ENCG00REU/from 2025-12-21T00:00:00Z to 2025-12-30T00:00:00Z, period 1D/10 elts
251231T01:35:52.564|D|exit_code |Exit code returned: 0, ConvertGnss ENCG00REU/from 2025-12-21T00:00:00Z to 2025-12-30T00:00:00Z, period 1D/10 elts

S6 Detailed statistics per network and per station between 2025/07/01 and 2025/12/31

S6.1 Detailed statistics for GL network

site	# of files fetched					success ratio			remain. ratio	exec. time			
	total	D+1	D+2	D+3/+10	> D+10	D+1	D+2	D+10	after D+10	mean	median	min	max
ABDZ00GLP	185	182	2	1	0	98.38%	99.46%	100.0%	0.0%	5927.12s	5645.18s	3149.91s	10400.07s
ABG000GLP	187	183	2	2	0	97.86%	98.93%	100.0%	0.0%	56.18s	52.64s	38.3s	276.7s
AMC000GLP	185	185	0	0	0	100.0%	100.0%	100.0%	0.0%	8.55s	8.07s	5.56s	16.66s
BULG00GLP	212	185	3	24	0	87.26%	88.68%	100.0%	0.0%	10.41s	10.35s	5.95s	15.14s
CBEZ00GLP	182	178	3	0	1	97.8%	99.45%	99.45%	0.55%	3613.27s	3470.22s	1409.96s	8019.91s
CRA200GLP	199	132	4	25	38	66.33%	68.34%	80.9%	19.1%	4.85s	4.94s	1.79s	5.91s
DHS000GLP	197	140	29	20	8	71.07%	85.79%	95.94%	4.06%	13889.82s	14259.65s	3289.78s	38190.07s
DSD000GLP	210	155	24	21	10	73.81%	85.24%	95.24%	4.76%	3000.17s	3269.94s	790.27s	6110.09s
F56200GLP	179	138	4	17	20	77.09%	79.33%	88.83%	11.17%	20.79s	21.16s	15.32s	26.86s
F80200GLP	185	185	0	0	0	100.0%	100.0%	100.0%	0.0%	5.43s	5.22s	4.36s	9.23s
FNG000GLP	185	182	3	0	0	98.38%	100.0%	100.0%	0.0%	32.03s	29.91s	14.48s	84.08s
HOUZ00GLP	187	185	0	2	0	98.93%	98.93%	100.0%	0.0%	1.9s	1.9s	1.76s	2.37s
LEN000GLP	185	185	0	0	0	100.0%	100.0%	100.0%	0.0%	2.7s	2.67s	2.35s	4.55s
MGL000GLP	184	154	21	9	0	83.7%	95.11%	100.0%	0.0%	3035.08s	3064.96s	899.95s	9020.08s
PAR100GLP	167	158	1	8	0	94.61%	95.21%	100.0%	0.0%	4.72s	3.71s	2.97s	13.07s
PSA100GLP	162	4	4	27	127	2.47%	4.94%	21.6%	78.4%	2.18s	2.0s	1.9s	2.84s
SAM000GLP	78	37	1	9	31	47.44%	48.72%	60.26%	39.74%	3.03s	3.18s	0.94s	3.56s
SAV000GLP	147	131	2	14	0	89.12%	90.48%	100.0%	0.0%	2.9s	3.02s	1.41s	3.51s
SBL000BLM	184	158	20	6	0	85.87%	96.74%	100.0%	0.0%	3057.19s	3129.9s	1220.01s	4570.2s
SOUF00GLP	225	139	10	63	13	61.78%	66.22%	94.22%	5.78%	33.53s	33.92s	9.9s	47.4s
TAR100GLP	234	135	15	59	25	57.69%	64.1%	89.32%	10.68%	4.59s	4.6s	2.72s	5.88s
TDB000GLP	187	149	26	12	0	79.68%	93.58%	100.0%	0.0%	3224.35s	3284.81s	1240.03s	5009.89s

Table S1 Detailed statistics for GL network

S6.2 Detailed statistics for MQ network

site	# of files fetched					success ratio			remain. ratio	exec. time			
	total	D+1	D+2	D+3/+10	> D+10	D+1	D+2	D+10	after D+10	mean	median	min	max
CHN000MTQ	184	182	2	0	0	98.91%	100.0%	100.0%	0.0%	25.16s	24.44s	22.21s	34.35s
FSDCO0MTQ	184	184	0	0	0	100.0%	100.0%	100.0%	0.0%	1.41s	1.39s	1.29s	1.87s
HAB000MTQ	194	185	1	8	0	95.36%	95.88%	100.0%	0.0%	0.82s	0.82s	0.12s	1.02s
ILAM00MTQ	183	182	1	0	0	99.45%	100.0%	100.0%	0.0%	1295.91s	1210.36s	960.94s	3889.95s
LAM000MTQ	184	184	0	0	0	100.0%	100.0%	100.0%	0.0%	9.98s	9.48s	8.78s	50.9s
MFO000MTQ	183	145	25	13	0	79.23%	92.9%	100.0%	0.0%	19.64s	14.47s	6.85s	225.23s
MLM000MTQ	592	210	45	337	0	35.47%	43.07%	100.0%	0.0%	6.39s	6.44s	1.62s	23.45s
MPLO00MTQ	184	184	0	0	0	100.0%	100.0%	100.0%	0.0%	7.12s	5.94s	4.4s	154.06s
SAM000MTQ	182	87	46	38	11	47.8%	73.08%	93.96%	6.04%	3516.55s	3750.39s	1710.03s	5220.14s
SCH200MTQ	184	184	0	0	0	100.0%	100.0%	100.0%	0.0%	6.32s	5.28s	1.79s	39.61s

Table S2 Detailed statistics for MQ network

S6.3 Detailed statistics for PF network

site	# of files fetched					success ratio			remain. ratio	exec. time			
	total	D+1	D+2	D+3/+10	> D+10	D+1	D+2	D+10	after D+10	mean	median	min	max
BOMGOOREU	167	162	4	1	0	97.01%	99.4%	100.0%	0.0%	102.37s	100.83s	43.64s	233.39s
BORGOOREU	105	75	2	9	19	71.43%	73.33%	81.9%	18.1%	34.67s	28.85s	10.08s	94.44s
C98GOOREU	181	175	4	2	0	96.69%	98.9%	100.0%	0.0%	23.76s	22.64s	9.0s	81.19s
CASGOOREU	185	178	4	3	0	96.22%	98.38%	100.0%	0.0%	14.7s	13.57s	11.22s	104.0s
CFNGOOREU	79	77	1	1	0	97.47%	98.73%	100.0%	0.0%	55.5s	49.05s	19.51s	327.51s
CRAGOOREU	182	177	3	2	0	97.25%	98.9%	100.0%	0.0%	16.84s	12.31s	10.57s	93.96s
DERGOOREU	101	92	2	7	0	91.09%	93.07%	100.0%	0.0%	54.11s	44.3s	25.34s	161.01s
DSRGOOREU	100	96	2	2	0	96.0%	98.0%	100.0%	0.0%	407.86s	379.86s	109.86s	848.94s
ENCGOOREU	184	176	4	4	0	95.65%	97.83%	100.0%	0.0%	210.31s	205.1s	194.88s	330.1s
ENOGOOREU	184	176	4	4	0	95.65%	97.83%	100.0%	0.0%	24.0s	23.92s	3.53s	53.13s
FEUGOOREU	184	173	6	5	0	94.02%	97.28%	100.0%	0.0%	65.99s	60.36s	43.3s	206.89s
FJAGOOREU	184	176	4	4	0	95.65%	97.83%	100.0%	0.0%	92.51s	88.96s	32.01s	219.73s
FOAGOOREU	184	175	5	4	0	95.11%	97.83%	100.0%	0.0%	83.63s	77.66s	70.12s	152.72s
FREGOOREU	183	61	2	9	111	33.33%	34.43%	39.34%	60.66%	50.65s	49.75s	32.66s	87.16s
GBSGOOREU	187	175	7	5	0	93.58%	97.33%	100.0%	0.0%	56.05s	41.13s	29.79s	218.87s
GITGOOREU	184	176	5	3	0	95.65%	98.37%	100.0%	0.0%	44.4s	41.98s	19.43s	103.79s
GPNGOOREU	184	175	5	4	0	95.11%	97.83%	100.0%	0.0%	80.37s	78.62s	24.71s	167.36s
GPSGOOREU	183	163	14	6	0	89.07%	96.72%	100.0%	0.0%	150.0s	125.75s	27.42s	496.43s
HDLGOOREU	186	182	3	1	0	97.85%	99.46%	100.0%	0.0%	56.76s	45.73s	24.64s	278.69s
MAIGOOREU	169	149	3	17	0	88.17%	89.94%	100.0%	0.0%	4.57s	4.28s	2.22s	82.2s
PBRGOOREU	186	178	5	3	0	95.7%	98.39%	100.0%	0.0%	15.71s	15.37s	10.65s	37.27s
PRAGOOREU	292	97	4	9	182	33.22%	34.59%	37.67%	62.33%	199.19s	194.88s	100.12s	398.98s
PVDGOOREU	173	93	4	10	66	53.76%	56.07%	61.85%	38.15%	27.81s	20.55s	15.6s	157.03s
RVAGOOREU	186	178	5	3	0	95.7%	98.39%	100.0%	0.0%	65.41s	42.04s	26.18s	391.55s
SNEGOOREU	198	190	5	3	0	95.96%	98.48%	100.0%	0.0%	450.58s	443.4s	409.65s	652.41s
TKRGOOREU	182	119	32	31	0	65.38%	82.97%	100.0%	0.0%	454.08s	176.3s	12.29s	1077.11s
TRCGOOREU	42	17	3	21	1	40.48%	47.62%	97.62%	2.38%	608.51s	565.18s	360.87s	1171.08s

Table S3 Detailed statistics for PF network